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11/8

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/622,217

07/18/2003

Khawar M. Zuberi

M1103.70194US00

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45840 7590 12/18/2006
WOLF GREENFIELD (Microsoft Corporation)
C/O WOLF, GREENFIELD & SACKS, P.C.
FEDERAL RESERVE PLAZA
600 ATLANTIC AVENUE
BOSTON, MA 02210-2206

EXAMINER

SURVILLO, OLEG

ART UNIT

PAPER NUMBER

2112

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

12/18/2006

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/622,217	ZUBERI, KHAWAR M.	
	Examiner	Art Unit	
	Oleg Survillo	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/18/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/06/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Paragraph [0031] refers to Fig. 2 and depicts flowchart 200. The above listed reference sign is not shown in Fig. 2. Paragraph [0033] refers to Fig. 3 and Fig. 4 and describes STag 401, RDMA packet 403, and requested data 407. The above listed reference signs are not shown in Fig. 3 or Fig. 4. Paragraph [0037] refers to Fig. 5, Fig. 6a, and Fig. 6b and describes STag 401. The above listed reference sign is not shown in Fig. 5, Fig. 6a, or Fig. 6b. Paragraph [0037] refers to NIC 609 and NIC 610. The above listed reference signs are not shown in any of the figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the

Application/Control Number: 10/622,217

Art Unit: 2112

description: In Fig. 1, the following reference characters: 121, 131, 132, 133, 134, 135, 136, 137, 144, 145, 146, 147, 150, 151, 155, 161, 171, 180, 190, and 195. In Fig. 3, reference character network layer 307. In Fig. 5, reference characters system memory 502, and network layer 507. In Fig. 6a, reference characters: internet 613, blocks 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, and 624. In Fig. 6b, reference character block 648. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "606" has been used to designate both block 606 of Fig. 6a and RDMA packet 606 shown in block 620 of Fig. 6a. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

Art Unit: 2112

only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show reference characters for components shown in blocks 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, and 650, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are

Art Unit: 2112

not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because Fig. 2 has RDMA misspelled in blocks 205 and 207. Also, in block 207 line 5 word "send" should read "sends". Fig. 4 has RDMA misspelled in block 428. Fig. 6b block 646 line 3 word "second" is misspelled.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency.

Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities: it is stated in the background of the invention that NIC in the first machine generates the STag (Paragraph [0004]). RDMA Protocol Verbs Specification by Jeff Hilland shows that consumer, comprising application program, generates STags by forming a combination of STag Index with STag key (Page 19).

Appropriate correction is required.

Claim Objections

7. Claim 1 is objected to because of the following informalities: line 3 word "interfaces" should be in a singular form. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 4-7, 15, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyd et al. (6,721,806)

As to claim 1, Boyd shows first and second network interfaces comprising IPSOE (118) and (120) in the same host processor node (104) where IPSOE is used to interface to IP net (100) (col. 5, line 38) and is implemented in hardware (col. 5, lines 54-55), being a primary and alternate RNICs. Boyd shows sending and receiving messages comprising work queues (WQ) that are assigned as a queue pair (QP) (col. 2, lines 1-5). Based on description of (Fig. 7) and (Fig. 11), it is inherent that a message is being received from the second network interface to a program component comprising an operating system (col. 7, lines 11-23) where the message contains a message identifier (col. 11, lines 10-14), header identifying first and second devices comprising source and destination ports (col. 10, lines 66-67), in order to enable RNIC switchover and switchback mechanism (col. 2, lines 55-64). Boyd shows querying the first network interface to supply the range of QP numbers, CQ numbers, and the range of Memory Translation and Protection Table (col. 21, lines 20-24) which provide a list of identifiers and associated memory locations (col. 7, lines 39-44; col. 16, lines 1-40). It is inherent that the list is being supplied to a program component such as IPSOE or host operating system since the state information is can be maintained within RNIC itself or in a host memory (col. 15, lines 60-62). Boyd also shows transmitting a memory location associated with the identifier to the second network interface by sharing QP, CQ, and Memory TPT range between primary and alternate RNICs as described in (Fig. 11) where the alternate RNIC is transmitting the associated data field to the memory location associated with the identifier in case of primary RNIC outage (col. 2, lines 59-61).

As to claim 4, Boyd shows a computer readable media comprising a memory location to be a random access memory (col. 35, line 3).

As to claim 5, Boyd shows a program component being a computer operating system (col. 7, lines 14-17).

As to claim 6, Boyd shows the first and second network interfaces operating under RDMA protocol (col. 2, lines 55-57).

As to claim 7, Boyd shows the first and second network interfaces operating under RDMA protocol over TCP/IP protocol (col. 2, lines 33-35).

As to claim 15, Boyd shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1.

As to claims 18-21, Boyd shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1 and further showing the additionally recited elements, as discussed regarding claims 4-7.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2112

11. Claims 2-3, 8-14, 16-17, 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. (6,721,806) in view of the Internet Draft document "RDMA Protocol Verbs Specification" by Jeff Hilland.

As to claim 8, Boyd shows first and second network interfaces comprising IPSOE (118) and (120) in the same host computer comprising host processor node (104) where IPSOE is used to interface to IP net (100) (col. 5, line 38) and is implemented in hardware (col. 5, lines 54-55), being a primary and alternate RNICs. Boyd shows sending and receiving messages comprising work queues (WQ) that are assigned to a consumer comprising program component as a queue pair (QP) (col. 2, lines 1-5) and where send work queue (SQ) contains work queue elements (WQE) describing data to be transmitted. Receive work queue (RQ) contains WQEs describing where to place incoming data comprising identifier (col. 8, lines 15-22). Based on description of (Fig. 5), (Fig. 7) and (Fig. 11), it is inherent that a message is being received from a remote computer (col. 10, lines 9-13) comprising remote host processor node (104) to a RNIC on a local host computer where the message contains a message identifier specified by DDP/RDMA header (col. 11, lines 10-14) where the header is being added by RNIC (col. 13, lines 25-27). Boyd shows sending a message to a program component comprising work completion queue WC (414) indicating reception of a message comprising identifier (Fig. 4, col. 2, lines 6-10), querying the first network interface to supply the range of QP numbers, CQ numbers, and the range of Memory Translation and Protection Table (col. 21, lines 20-24) which provide a list of identifiers and associated memory locations (col. 7, lines 39-44; col. 16, lines 1-40). It is inherent that

Art Unit: 2112

the list is being supplied to a program component such as IPSOE or host operating system since the state information can be maintained within RNIC itself or in a host memory (col. 15, lines 60-62). Boyd also shows receiving a memory location associated with the identifier to the second network interface by sharing QP, CQ, and Memory TPT range between primary and alternate RNICs as described in (Fig. 11) where the alternate RNIC is transmitting the associated data field to the memory location associated with the identifier in case of primary RNIC outage (col. 2, lines 59-61). It is inherent that the alternate RNIC can transmit the associated data field to the memory location only in the presence of corresponding identifier.

Boyd does not show invalidating the identifier arriving from the remote computer if the list of local identifiers generated by a host computer does not include the arriving identifier.

Hilland shows invalidating an identifier comprising STag to prevent RNIC from accessing memory locations via the STag associated with that Memory Region (Page 112, lines 28-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Boyd to invalidate an identifier comprising STag in order to prevent RNIC from accessing memory locations via the STag associated with that Memory Region (Page 112, lines 28-30).

As to claims 2 and 9, Boyd in view of Hilland shows the identifier being invalidated by the operating system (Page 90, lines 8-12 in Hilland). It is inherent that

Art Unit: 2112

the identifier is being invalidated by changing a validation field in RDMA header (622) as showed in the RDMA protocol specification for the purpose of invalidating identifiers that are no longer useful (RDMA protocol specification, page 20, lines 32-41).

As to claims 3 and 10, Boyd in view of Hilland shows that invalidating STag identifier will prevent RNIC from accessing the memory location that STag is associated with (Page 112, lines 28-31 in Hilland).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Boyd by dropping or discarding the message data associated with the identifier (Fig. 6 in Boyd) if it cannot be successfully placed in the memory location due to invalidated identifier.

As to claim 11, Boyd shows a computer readable media comprising a memory location to be a random access memory (col. 35, line 3).

As to claim 12, Boyd shows a program component being a computer operating system (col. 7, lines 14-17).

As to claim 13, Boyd shows the first and second network interfaces operating under RDMA protocol (col. 2, lines 55-57).

As to claim 14, Boyd shows the first and second network interfaces operating under RDMA protocol over TCP/IP protocol (col. 2, lines 33-35).

Art Unit: 2112

As to claim 16, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 1, and further showing the additionally recited elements, as discussed regarding claim 2.

As to claim 17, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 16, and further showing the additionally recited elements, as discussed regarding claim 3.

As to claims 22-23, 25-28, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 8, and further showing the additionally recited elements, as discussed regarding claims 9, 11-14.

As to claim 24, Boyd in view of Hilland shows instructions stored on a computer readable medium (col. 35, lines 1-5) performing the recited steps of claim 22, and further showing the additionally recited elements, as discussed regarding claim 23.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

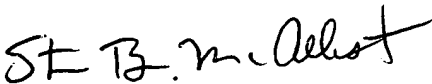
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Oleg Survillo whose telephone number is 571-272-9691. The examiner can normally be reached on M-Th 8:00am-5pm, F 8:00am-4:30pm EST.

Art Unit: 2112

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Oleg Survillo


STEVE MCALLISTER
SUPERVISORY PATENT EXAMINER